In The Claims

Please delete claims 15, 18 and 19. Please amend claims 1-5; 7-11; 13-14; 16; 17; and 20, and add claims 21 - 23 as follows:

1. (Currently amended) An apparatus for passing electrical communication signals over valve control wires in an electronic irrigation system between a master data acquisition circuit and at least one ~~slave active~~ sensor circuits comprising:

   (a) an electronic irrigation controller ~~means~~ for controlling the application of irrigation fluid over a given area; ~~and~~

   ~~(b)~~ at least one control valve driven by electrical current from said irrigation controller ~~means~~ to control the flow of irrigation fluid to at least one dispersion nozzle; ~~and~~

   (c) an electrical connection between said irrigation control means and said control valve for use in applying power to said control valves; ~~said connection usually consisting of solid copper wire; and~~

   (d) a first ~~instance of~~ communications filter circuit~~ry~~ coupled to said electrical connection and located in the vicinity of said irrigation control ~~means~~; and

   (e) a second ~~instance of~~ communications filter circuit~~ry~~ coupled to said electrical connection and located in the vicinity of where said irrigation fluid is dispersed.

2. (Currently amended) The apparatus of claim 1 wherein the first and second ~~instances of said~~ communication filters ~~circuitry~~ provides isolation from electrical voltages and currents used to power said control valve, comprising at least one~~first and second~~

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capacitors configured to form a high pass filter which disallows the passage of valve power signals, yet allows higher frequency communication signals to pass through.

3. (Currently amended) The apparatus of claim 2 wherein the first and second ~~instances of said~~ communication filter circuits ~~circuitry~~ contain slew rate limiting circuitry, comprising a resistor and capacitor configured as a low pass filter, to prevent misfiring of solid state triac devices which may be used in said irrigation control means.

4. (Currently amended) The apparatus of claim 2 wherein the first and second ~~instances of said~~ communication filter circuits ~~circuitry~~ contain at least one diode for overvoltage and undervoltage protection of said data acquisition circuit and said ~~active~~ sensor circuits.

5. (Currently amended) The apparatus of claim 2 wherein the first and second instances of said communication filter circuits ~~circuitry~~ contain at least four terminals, two being connected to valve control wires, and two connected to sensor or data acquisition circuitry.

6. (Original) The apparatus of claim 1 wherein said electrical communication signals use a slow speed single bit encoding scheme to reduce the level of radio frequency emissions which may be generated during operation.

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7. (Currently amended) An apparatus for passing electrical communication signals over valve control wires in an electronic irrigation system between a data acquisition circuit and at least one passive sensor circuits comprising:

~~(a)~~ an electronic irrigation controller ~~means~~ for controlling the application of irrigation fluid over a given area; ~~and~~

(b) at least one control valve driven by electrical current from said irrigation controller ~~means~~ to control the flow of irrigation fluid to at least one dispersion nozzle; ~~and~~

(c) electrical connection between said irrigation controller ~~means~~ and said control valve for use in applying power to said control valves; ~~said connection usually consisting of solid copper wire; and~~

(d) a first communications filter circuit~~ry~~ coupled to said electrical connection and located in the vicinity of said irrigation controller ~~means~~; and

(e) a second communication ~~passive sensor~~ filter circuit~~ry~~ coupled to said electrical connection and to a passive sensor and located near ~~in the vicinity of~~ where said irrigation fluid is dispersed.

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8. (Currently amended) The apparatus of claim ~~7~~ wherein said first and second communications filter circuitry provides isolation from electrical voltages and currents used to power said control valve, comprising at least one ~~first and second~~

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capacitors configured to form a high pass filter which disallows the passage of valve power signals, yet allows higher frequency communication signals to pass through.

12 9. (Currently amended) The apparatus of claim ~~8~~ 10 wherein said first communications filter circuitry contains slew rate limiting circuitry, comprising a resistor and capacitor configured as a low pass filter, to prevent misfiring of solid state triac devices which may be used in said irrigation control means.

13 ~~10~~. (Currently amended) The apparatus, of claim ~~9~~ 12 wherein said first communications filter circuitry contains at least one diode for overvoltage and undervoltage protection of said data acquisition circuit.

11. (Currently amended) The apparatus of claim ~~8~~ 10 wherein said second communications ~~passive sensor~~ filter circuitry provides isolation from electrical voltages and currents used to power said control valve, comprising first and second capacitors and a resistor configured to form a high pass filter which disallows the passage of valve power signals, yet allows higher frequency communication signals to pass through.

14 ~~12~~. (Original) The apparatus for claim ~~7~~ 9 wherein said electrical communication signals are not transmitted continuously, but are intermittent with a period of time between each transmission sufficient to reduce to an acceptable level the radio frequency emissions which may be generated during operation.

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~~13.~~ (Currently amended) A method for ~~measuring resistance of a passive resistive sensor connected in parallel to valve control wires in an electronic irrigation system, the method comprising:~~

~~(a) providing a stimulus signal which is passed through a series resistor for the purpose of creating a voltage divider with said resistive sensor; and~~

~~(b) passing said signal through an isolation filter to said valve control wires, said isolation filter having first and second series capacitors configured to form a high pass filter for isolation from power voltages which may exist on valve control wires; and~~

~~(c) said stimulus signal is digital pulse of the proper magnitude and duration such that when it is passed to said valve control wires, the control valve which is connected in parallel briefly appears as a high impedance, such that for a small instant of time a voltage divider is created between the series resistor and resistive sensor; and~~

(d) ~~a high speed analog to digital converter is used to obtain a digital value of the voltage level that briefly exists in said voltage divider, further that said digital value is proportional to resistance level of said sensor, whereby the resistance level of the sensor can be mathematically derived~~.

passing electrical communication signals over valve control wires in an electronic irrigation system between a master data acquisition circuit and at least one sensor circuits comprising:

providing an electronic irrigation controller ~~means~~ for controlling the application of irrigation fluid over a given area; ~~and~~

providing at least one control valve driven by electrical current from said irrigation controller ~~means~~ to control the flow of irrigation fluid to at least one dispersion nozzle; and

providing an electrical connection between said irrigation control means and said control valve for use in applying power to said control valves; said connection usually consisting of solid copper wire; and

providing a first instance of communications filter circuitry coupled to said electrical connection and located in the vicinity of said irrigation control means; and providing a second instance of communications filter circuitry coupled to said electrical connection and located in the vicinity of where said irrigation fluid is dispersed.

14. (currently amended) The method of claim ~~13~~ 16, wherein said series resistor is connected with a capacitor in parallel to form a low pass filter, whereby the slew rate of said digital pulse is limited to less than 1 volt per microsecond to protect against premature firing of solid state triac devices generally used in irrigation control systems.

15. (Deleted)

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19 16. (currently amended) The method of claim ~~13~~ 16, wherein the magnitude and duration of said digital pulse is around 15 volts and 30 microseconds, respectively.

17. (currently amended) The method of claim ~~13~~ 16, wherein said passive resistive sensor is connected to said valve control wires through an isolation filter having first and second series capacitors configured to form a high pass filter for isolation from power voltages which may exist on valve control wires.

18. (Deleted)

19. (Deleted)

20. (currently amended) The method of claim ~~13~~ 16, wherein said stimulus signal is applied only intermittently, with a period of time between each stimulus signal, sufficient to reduce to an acceptable level the radio frequency emissions which may be generated during operation.

7 ~~21.~~ (new) The apparatus of claim 1, further comprising an active sensor coupled to the electrical connection and located in a vicinity of where the irrigation fluid is dispersed.

8 ~~22.~~ (new) The apparatus of claim 1, further comprising a passive sensor coupled to the electrical connection and located near where the irrigation fluid is dispersed.

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23. (new) The method of claim 13, further comprising:

(a) providing a stimulus signal which is passed through a series resistor for the purpose of creating a voltage divider with said resistive sensor; and

(b) passing said signal through an isolation filter to said valve control wires, said isolation filter having first and second series capacitors configured to form a high pass filter for isolation from power voltages which may exist on valve control wires; and

(c) said stimulus signal is digital pulse of the proper magnitude and duration such that when it is passed to said valve control wires, the control valve which is connected in parallel briefly appears as a high impedance, such that for a small instant of time a voltage divider is created between the series resistor and resistive sensor; and

(d) a high speed analog to digital converter is used to obtain a digital value of the voltage level that briefly exists in said voltage divider, further that said digital value is proportional to resistance level of said sensor, whereby the resistance level of the sensor can be mathematically derived.

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